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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,024	05/31/2007	Dirk Goldschmidt	2003P18131WOUS	1234

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SIEMENS CORPORATION
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EXAMINER	
ABOAGYE, MICHAEL	
ART UNIT	PAPER NUMBER
1733	
MAIL DATE	DELIVERY MODE
10/14/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,024	GOLDSCHMIDT ET AL.	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11,12 and 17-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11,12 and 17-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/27/2010 has been entered.

Status of Claims

2. Claim 13 has been cancelled, therefore claims 11, 12 and 17-19 are currently under consideration in the Application.

Claim Objections

3. Claim 11 is objected to because of the following informalities: in lines 17 and 18, "first constitute" and "second constitute" should be changed to "first constituent" and "second constituent" respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 11, 12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over McComas et al. (US Patent No. 4,705,203) in view of Marcin, Jr et al. (US Patent No. 5,914,059).

Regarding claim 11, McComas et al. teaches a method of repairing a component having a base material with an oriented microstructure(see, abstract and column 4, lines 1-10) comprising: applying a solder in a region of the component to be repaired (figure 3 shows such, also se, column 3, lines 35-49) wherein the solder comprises a constituent whose melting temperature is lower than the melting temperature of the component base material (se, column 2, lines 17-30); and heating the solder; wherein the component base material is not melted (see, column 2, lines 17-30); wherein during heating generating a temperature gradient in the region of the component to be repaired during the heating step to produce an oriented microstructure in the repaired site which comprises the same oriented microstructure as the surrounding base material (see, column 4, lines 1-10, the epitaxial growth illustrated in the cited portion would inherent comprise the generation of temperature gradient at the region of the component being repaired); wherein the solder comprises a first constituent (reads on the layer 15 with high boron content, see, figure 3 and column 3, lines 8-50) with a melting temperature lower than a melting temperature of the component base material and a second constituent having a high durability and a melting temperature greater than the first constituent melting temperature but below the base material melting

temperature (reads on the layer 25, see, figure 3 and column 4, line 43-55), wherein a first solder composition in which the first constituent makes up a high proportion is applied first, and a second solder composition in which the first constituent is reduced relative to the second constituent is subsequently applied (see, column 3, lines 8-50 and column 4, lines 28-55).

McComas et al. teaches heating the solder but fails to specifically teach heating by directly irradiating the solder with a laser beam at chosen speed.

Marcin, Jr et al. teaches a method for repairing a component having a base material with an oriented microstructure (see Marcin, Jr et al., column 2, lines 38-47), comprising: applying a solder in a region of the component to be repaired wherein the solder comprises a constituent whose melting temperature is lower than the melting temperature of the component base material (see, Marcin, Jr et al., column 2, lines 48-59); heating the solder by directly irradiating the solder with a laser beam or by induction heater. Marcin, Jr et al. also teaches directly irradiating the solder with a laser beam at a chosen speed relative to the component or a power of the laser beam for generating a temperature gradient in the region of the component to be repaired during the heating step (see, Marcin, Jr et al., column 2, line 47-column 3, line 24 and column 6, lines 14-28); thereby producing unconstrained and unidirectional solidification in the repaired site and also eliminating stress and cracks in said repaired area (see, Marcin, Jr et al., column 3, lines 5-24, lines 60-65, column 6, lines 64-67 and column 7, lines 30-37). It should be pointed out that said unconstrained and unidirectional solidification produced

in Marcin, Jr et al., reads on the claimed oriented microstructure since the two expressions technically means the same.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of McComas et al. to uses a laser heating source since said technique is known in the art as a viable alternative heating source as exemplified by Marcin, Jr et al. and it allows better control of the heating process, produces unconstrained and unidirectional solidification in the repaired site and also eliminates stress and cracks in said repaired area (see, Marcin, Jr et al., column 3, lines 5-24, lines 60-65, column 6, lines 64-67 and column 7, lines 30-37).

Regarding claim 12, McComas et al. in view of Marcin, Jr et al., teaches a repair method in which the temperature gradient is aligned so that it extends in the direction of the orientation of the oriented microstructure of the component base material (reads on the epitaxial growth illustrated by McComas et al. in column 4, lines 1-10).

Regarding claim 17, McComas et al. in view of Marcin, Jr et al., teaches a repair method in which the base material is heat treated during the soldering step (see, McComas et al., column 2, lines 5-11, 25-30, and claim 1).

Regarding claim 18, McComas et al. in view of Marcin, Jr et al., teaches a repair method in which the solder is in the form of a powder (see, McComas et al., abstract and column 2, lines 15-20).

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over McComas et al. (US Patent No. 4,705,203) in view of Marcin, Jr et al. as applied to claim 18 above and further in view of Philip (US Patent No. 7,416,108).

McComas et al. in view of Marcin, Jr et al. fails to teach solder in a form of nanopowder.

Philip teaches a method of repairing a super alloy component using solder in a form of nanopowder (see, column 3, lines 1-15 and column 4, lines 51-67).Philips teaches that nano-particles of an alloy or solder are known to exhibit lower incipient surface melting temperature than the melting of the bulk alloy (se, column 3, lines 1-15).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of McComas et al. in view of Marcin, Jr et al. to use solder in a form of nanopowder, since the use of solder in such physical/dimensional from is known in the art as exemplified by Philip, and that would allow soldering/repairing to be conducted at a lower temperature, which is much more economical since a laser heat input requirement (see Philip, column 3, lines 1-15).

Response to Arguments

7. Applicant's arguments filed 08/31/2010 have been fully considered but they are not persuasive.

Applicant argues that McComas et al. does not teach what the Examiner contends; but rather teaches a layer 15 of superalloy material containing a melt depressant (boron) is applied to the cleaned area (column 3 lines 7-8). Then, a second

layer 25 is sprayed over the first layer comprising a superalloy material which will usually be similar in composition to the substrate, but without the melting point depressant and which therefore has a melting point approximating that of the substrate (column 3 lines 26-31). Because of the melt depressant in the first layer, the article can be heated to a temperature where layer 15 melts but substrate 5 and layer 25 do not (column 3 lines 37-41). Furthermore contrast McComas et al., the instant claim recites "wherein a first solder composition in which the first constitute makes up a high proportion is applied first, and a second solder composition in which the first constitute is reduced relative to the second constitute is subsequently applied", which distinguishes over McComas et al.

In responds, the Examiner agrees that McComas et al. teaches an embodiment in which the second layer is similar in composition to the substrate (column 3, lines 25-32); however he also teaches an alternative embodiment in the first solder layer (15) contains a higher percentage of boron, and the second solder layer (25) contains some percentage of boron but lower than that of the first solder layer; resulting in said second layer having a melting point and composition different from the base material or the substrate. And that such teaching reads on the said new limitations which Applicant alleges distinguishes over McComas et al. (See, McComas et al., column 3, lines 7-50 and column 4, lines 28-55).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art Unit 1733

/M. A./
Examiner, Art Unit 1733